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# Two New Species and One New Combination in Leafless Malagasy *Cynanchum* (Asclepiadaceae)

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**ABSTRACT.** Two new leafless succulent species from Madagascar, *Cynanchum folotsioides* and *Cynanchum hardyi*, are described. Both species have been in cultivation for a considerable time. However, because of the general confusion in Malagasy *Cynanchum*, they have only now been recognized as new to science. *Folotsia aculeata* (Descoings) Descoings is transferred to *Cynanchum*.

In the course of a revision of the Malagasy Asclepiadaceae-Cynanchinae for the Flora of Madagascar project, we received two plants representing species that were not only undescribed, but of which there were no specimens in any of the collections consulted (K, MO, P). *Cynanchum folotsioides* (Fig. 2) possesses yellow latex and striped succulent shoots, a character combination shared with *C. decaisnianum* Descoings, *C. mahafalense* Jumelle & H. Perrier, and *C. messeri* Jumelle & H. Perrier. The latter two possess corolla lobes densely covered with monocellular trichomes, while those in *C. decaisnianum* and *C. folotsioides* are glabrous. In a strictly corona-based classification, *C. folotsioides* would be described as a member of the genus *Folotsia* because its more prominent corona lobes stand in interstaminal position. However, the combination of striped shoots, yellow latex, and anther wings of two ridges with upwardly directed bristles in between clearly places this species in *Cynanchum* L. The same argument holds for the atypical *Folotsia aculeata* Descoings (Fig. 1). This species, with its narrowly campanulate, highly fused corolla and its stylar head with a long appendage, also possesses the yellow latex and striped shoots associated with *Cynanchum*. However, its much reduced anther wings suggest neither genus. If the corona type of *C. decaisnianum*, with its ten lobes (five in staminal, five in interstaminal position), is considered as the ancestral type, the idea that the staminal lobes have undergone reduction, as in *C. folotsioides* and *F. aculeata*, is not any

more unlikely than a reduction of the interstaminal lobes. The present authors have recognized the combination of shoot morphology, latex color, and anther wing morphology as systematically more telling than slight variations in corona morphology, a character likely subject to strong selection by pollinators. Therefore, exceedingly smooth shoots, white latex, and papillose anther wings are considered characteristic of *Folotsia*, in addition to a dominance of the interstaminal corona lobes. A cladistic analysis of all Malagasy and African *Cynanchum* and *Folotsia* species in preparation by the senior author supports this conclusion. Possibly, more species can be attributed to the distinct group of species characterized by yellow latex; however, latex color is often not recorded by collectors.

The second new species, *Cynanchum hardyi* (Fig. 3), belongs to a different alliance within the leafless Malagasy Cynanchinae. Its closest relative is the widespread and frequent *C. arenarium* Jumelle & H. Perrier, a species better known under the later name *C. nodosum* (Jumelle & H. Perrier) Descoings. The rare *C. hardyi* from the west coast of Madagascar differs from *C. arenarium* by its much more slender flower, distinctly darker corolla lobes, and an umbonate stylar head. More subtle, but equally important, distinctions are the anther wings of *C. hardyi* being much shorter than the anthers, and, especially, the unique attachment of the pollinium to the translator arm along a long, slender tail.

***Cynanchum aculeatum*** (Descoings) Liede & Meve, comb. nov. Basionym: *Prosopostelma aculeata* Descoings, Natur. Malgache 9: 184. 1957. *Folotsia aculeata* (Descoings) Descoings, Adansonia sér. 2, 1: 313. 1961. TYPE: Madagascar. Toliara, Cap Sainte-Marie, sur la plateforme terminale, Descoings 1013 (holotype, P; isotype, TAN). Figure 1.



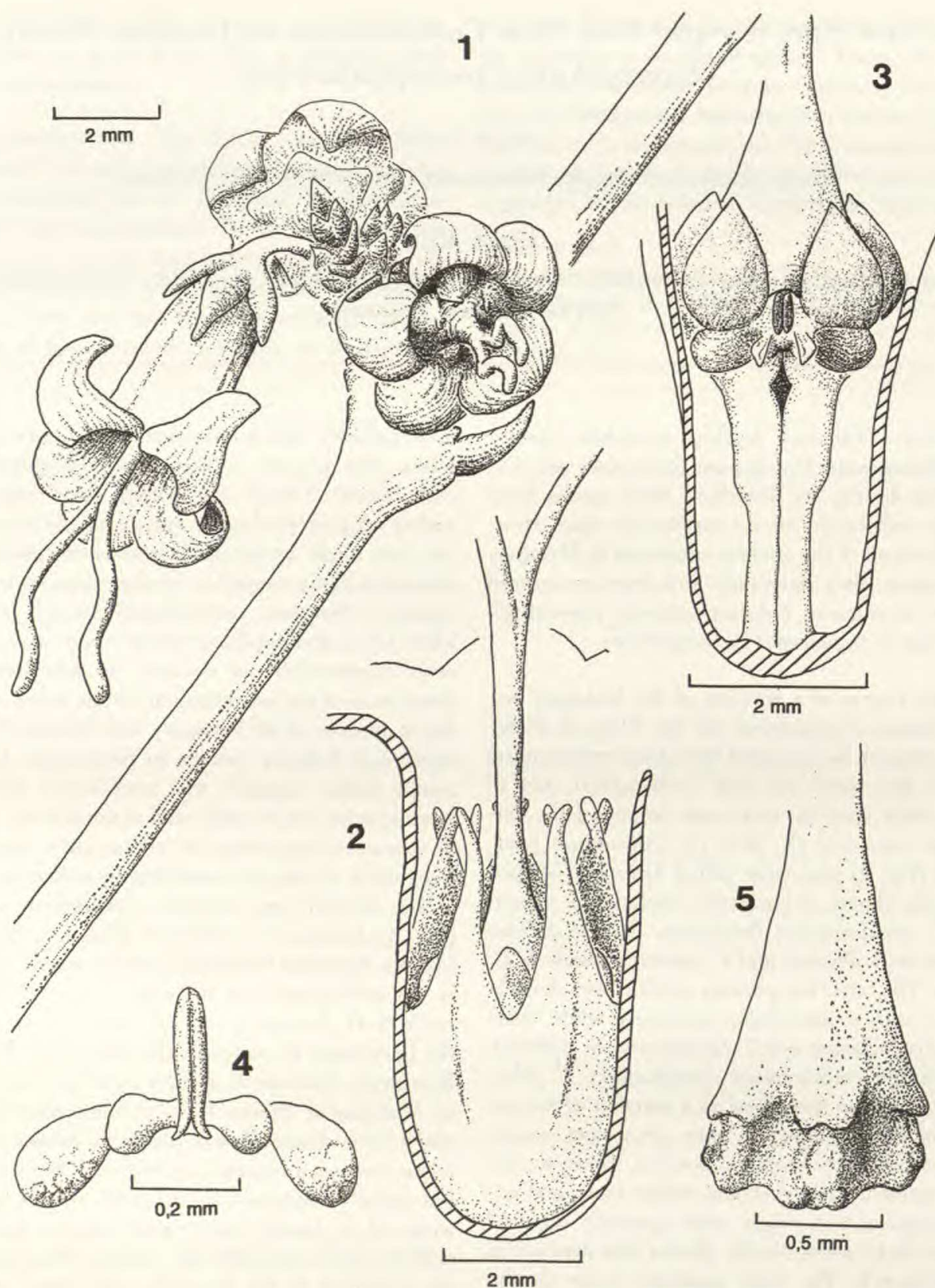


Figure 1. *Cynanchum aculeatum* (Descoings) Liede & Meve. —1. Stem with inflorescence. —2. Corona. —3. Gynostegium. —4. Pollinarium. —5. Styler head, basal part. 1–5 drawn by Jim Conrad from *Descoings 1013*.

***Cynanchum folotsioides* Liede & Meve, sp. nov.**

TYPE: Madagascar. Toliara, 70 km before Ansomala, 1969, *Rauh 21847* (holotype, K; isotype, MSUN). Figure 2.

Plantae latice flavo; corona gynostegialis tubulari, partibus staminalibus interstaminalibusque late connatis,

partibus staminalibus filamentis connatis, breve bifidis, partibus interstaminalibus emarginatis; gynostegio sessili.

*Plants* twining to erect. Shoots succulent, finely striate, sparsely glabrescent with erect, 250–300- $\mu$ m-long trichomes; internodes 2–15 cm long, 5–8 mm diam. Latex yellow. *Leaf rudiments* scalelike,



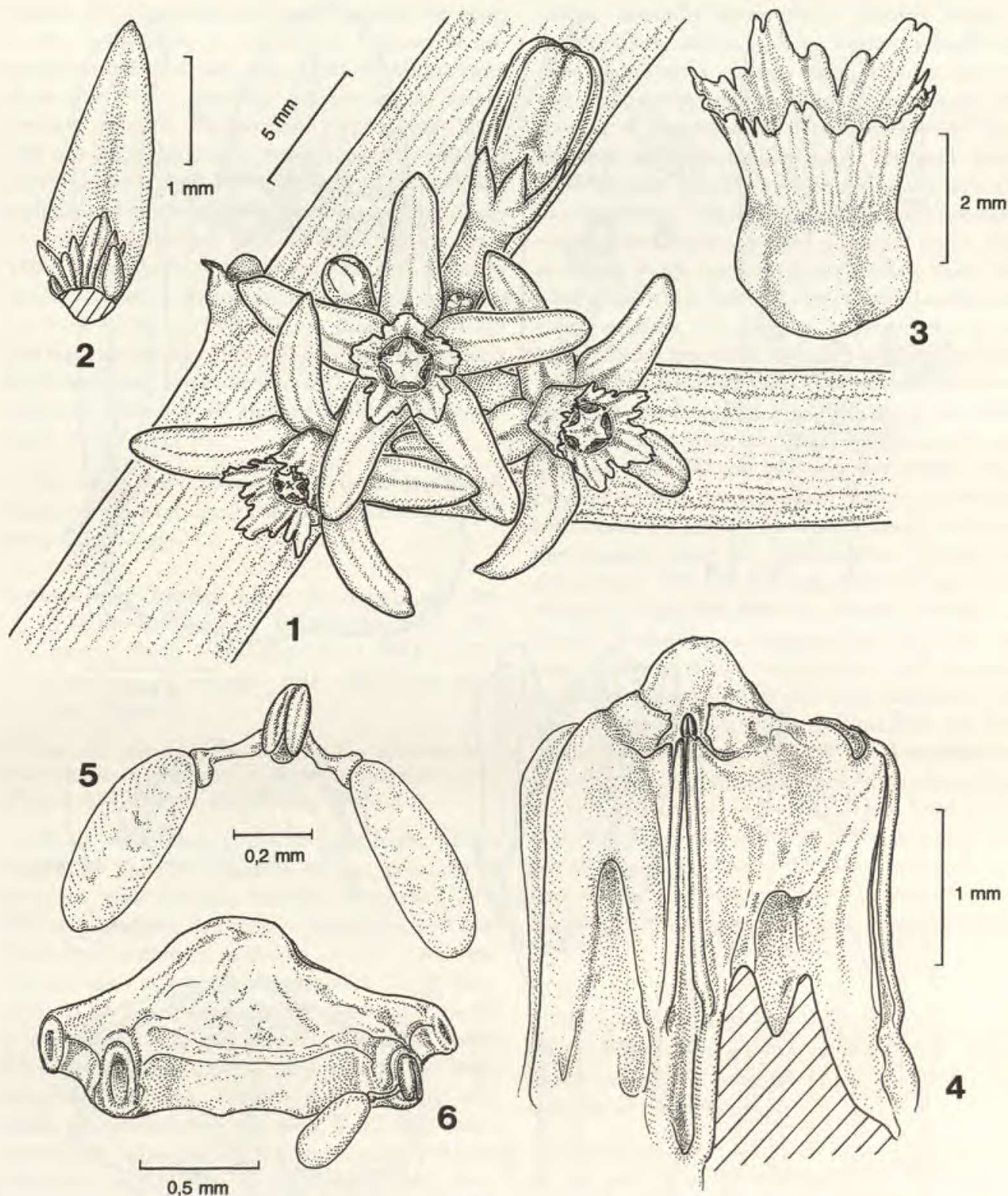


Figure 2. *Cynanchum folotsioides* Liede & Meve. —1. Node with inflorescence. —2. Leaf rudiment. —3. Corona. —4. Gynostegium. —5. Pollinarium. —6. Styler head. 1–6 drawn by U. Meve from *Rauh* 21847.

2–2.4 mm long, 1–1.2 mm wide, ovate, apically obtuse. *Inflorescences* one per node, umbelliform, sessile. *Flowers* nectariferous, faintly and pleasantly sweet scented; floral bracts 0.7–0.9 mm long, 0.4–0.5 mm wide at the base, ovate, non-glandular, glabrous. *Pedicels* 7–9 mm long, sparsely covered with flexuous, 300–400- $\mu$ m-long trichomes. *Floral buds* 4.5–5 mm long, 3 mm diam., cylindrical, with imbricate aestivation. *Calyx* basally fused (colleters

visible in the sinuses of the calyx lobes), campanulate, abaxially glabrous, the lobes 1.3–1.5 mm long, 1.2–1.4 mm wide, triangular, apically acute. *Corolla* rotate; the lobes 4–4.5 mm long; abaxially and adaxially brownish, purple along the main nerves; horizontal to recurved, oblong, apically obtuse. *Gynostegial corona* white, tubular, 450–500 mm high, exceeding the gynostegium, but not obscuring it; staminal and interstaminal corona parts



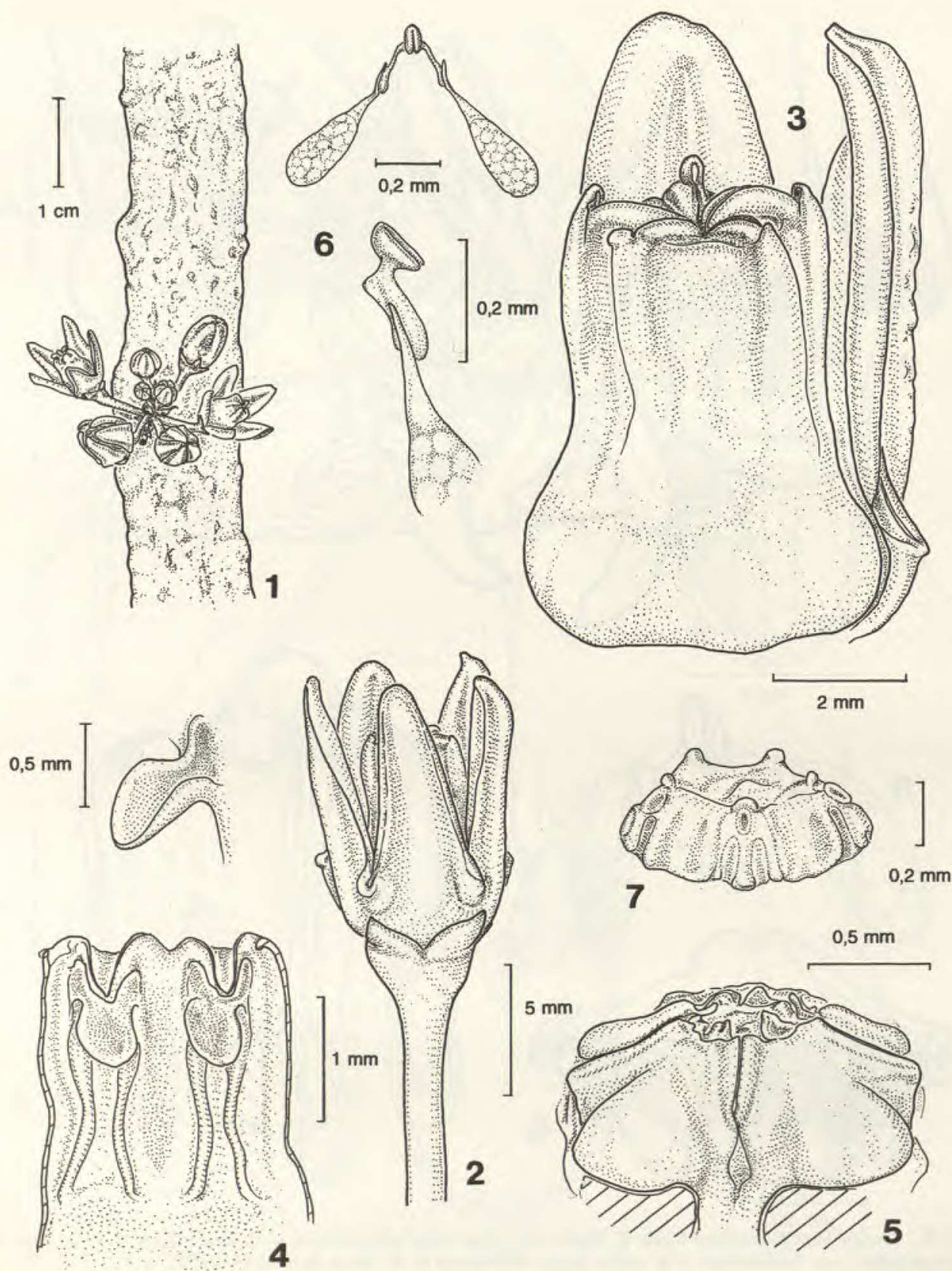


Figure 3. *Cynanchum hardyi* Liede & Meve. —1. Node with inflorescence. —2. Flower. —3. Corona. —4. Corona adaxially; top: ligule in side view; bottom: two staminal corona parts and one interstaminal corona part unfolded. —5. Gynostegium. —6. Pollinarium; top: frontally; bottom: side view. —7. Styler head. 1–7 drawn by U. Meve from *Hardy & Jacobsen 3571*.

fused for more than  $\frac{3}{4}$  of total corona length, the staminal corona parts adnate to the filament, laminar, adaxially forming two vertical ridges, with lobes ovate, apically erect, with straight, emarginate margins, the interstaminal corona parts longer

and thinner than staminal parts, laminar. *Gynostegium* sessile, 2.0–2.2 mm high, 1.8–2.0 mm diam. Stamens with filament; anthers higher than broad, rectangular, abaxially planar; anther wings 1400–1600  $\mu\text{m}$  long, extending basally beyond the anther



proper, parallel above, divergent toward the base, in the same plane as the anther. Connective appendages 600–700  $\mu\text{m}$  long, 1100–1200  $\mu\text{m}$  wide, depressed ovate, equaling the stamen in width, strongly inflexed. *Pollinarium*: corpusculum 300–320  $\mu\text{m}$  long, margins of the corpuscular cleft parallel; translator arms 130–150  $\mu\text{m}$  long, cylindrical, s-shaped (concave-convex), thickened at the insertion of the pollinium; pollinia 300–350  $\mu\text{m}$  long, 130–150  $\mu\text{m}$  wide, ovate in cross section, ovoid to oblong, apically attached to the translator arm. *Stylar head* white, 1400–1500  $\mu\text{m}$  diam., 850–1000  $\mu\text{m}$  high; upper part 400–450  $\mu\text{m}$  high, higher than the lower part, depressed-conical. *Fruit* and *seed* unknown. *Chromosome number*:  $2n = 22$  (voucher: Rauh 21847, MSUN).

The name of the species refers to the fact that it might be mistaken for a member of the genus *Folotsia* at first sight.

***Cynanchum hardyi*** Liede & Meve, sp. nov.

TYPE: Madagascar. Toliara–Morombé, Morombé, *Hardy & Jacobsen 3571* (PRE 17127) (holotype, K; isotypes, PRE, MSUN (in spiritu)). Figure 3.

*Cynancho arenario* affine, sed floribus cylindrioribus, alis antherarum brevioribus, polliniis corpusculum caudis affixis, capite stylorum non tabulari differt.

*Plants* decumbent, 25–35 cm high, richly branched. Shoots succulent, warty, prominently glaucous, with isolated, flexuous trichomes, 350–550  $\mu\text{m}$  long, on the crests; internodes 6–8 mm diam. *Leaf rudiments* scalelike, sessile, caducous. *Inflorescences* subsessile, bostrychoid, 12–20-flowered, 6–10 flowers open at the same time; rachis 1–2 mm long, straight. *Flowers* with floral bracts 0.5–0.6 mm long, 0.6–0.7 mm wide at the base, triangular, glabrous. *Pedicels* 4–5 mm long, glabrous. *Floral buds* 4–5 mm long, 3–3.5 mm diam., ovoid, with imbricate aestivation. *Calyx* fused for a little more than  $\frac{1}{4}$  of its length, campanulate; abaxially glabrous, the lobes 1.3–1.5 mm long, 1–1.1 mm wide, triangular, apically acute. *Corolla* campanulate; fused for about  $\frac{1}{4}$  of its length; corolla lobes 4–4.5 mm long, 1.3–1.6 mm wide, basally

yellow, abaxially brown above, forming bulges at their sinuses, patent, oblong, keeled, apically obtuse. *Gynostegial corona* white, tubular, 2.3–2.5 mm high, exceeding the gynostegium, entirely obscuring it, consisting of almost completely fused staminal and interstaminal parts. Staminal corona parts apically strongly inflexed, adaxially with solid, liguliform, inflexed appendage. Interstaminal corona parts laminar, keeled along the upper third of corona length resulting in a cucullate shape, the lobes bifid when flattened, erect, with laterally involute margins. *Gynostegium* sessile, 1.0–1.2 mm high, 1.2–1.3 mm diam. Stamens without filaments; anthers hexagonal, abaxially gibbose; anther wings 400–500  $\mu\text{m}$  long, not extending along the whole length of the anther, the anther forming a “pseudostipe” 250–300  $\mu\text{m}$  tall; adjacent anther wings parallel to each other, basally slightly centrifugal, with additional guiding structure formed by the anther margins along the “pseudostipe.” Connective appendages 100–150  $\mu\text{m}$  long, 150–170  $\mu\text{m}$  wide, triangular, narrower than the stamen, strongly inflexed. *Pollinarium*: corpusculum 100–120  $\mu\text{m}$  long, margins of the corpuscular cleft parallel; translator arms 130–150  $\mu\text{m}$  long, flattened, convexly recurved, rectangular; pollinia 500  $\mu\text{m}$  long (fertile part 300  $\mu\text{m}$ ), 130–150  $\mu\text{m}$  wide, ovate in cross section, clavate, attached to the corpusculum along a tail of the pollinium. *Stylar head* white, 450–500  $\mu\text{m}$  diam., 250–300  $\mu\text{m}$  high; upper part 50–100  $\mu\text{m}$  high, shorter than the lower part, umbonate. *Fruit* and *seed* unknown. *Chromosome number*:  $2n = 22$  (voucher: *Hardy & Jacobsen 3571*, MSUN).

*Habitat.* Beach.

The species is named in honor of David S. Hardy, keen South African collector and grower of Malagasy succulents, from whom we received living material of this species.

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